

Appendix



Waller Creek Corridor Framework Plan

CONSULTANT TEAM

Michael Van Valkenburgh Associates Inc.
Project Planning & Landscape Architecture

LimnoTech
Hydrology

Applied Ecological Services Inc.
Ecology

**Lady Bird Johnson Wildflower Center
Ecosystem Design Group**
*Local Ecology
Native Plantings & Management Strategy*

Big Red Dog
Civil Engineering

dwg.
Local Landscape Architecture

ETM Associates LLC
Public Space Management

Greenberg Consultants Inc.
Urban Design

HNTB
*Bridge Design &
Structural Engineering*

Olsson Associates
Soil Science & Ecosystem Services

Altura Solutions, L.P.
Accessibility Compliance (RAS)



TABLE OF CONTENTS

| AQUATIC HABITAT | | | | |
|--|---|-------------------------------------|--------------------|--------|
| subject | filename | author | date | page # |
| Aquatic Habitat Site Map | AQUATIC_300sc.pdf | MVVA, AES, LBJWC, LimnoTech | April 14, 2015 | 6 |
| BRIDGES | | | | |
| subject | filename | author | date | page # |
| Waller Creek Bridges & Abutments | 2014.09.15_Bridge Studies Draft2.pdf | MVVA | September 15, 2014 | 14 |
| E. Third Street Bridge Over Waller Creek From 1935 | BDG-6-B-68-001 - BDG-6-B-68-005.pdf | C.G. Levander | January 16, 1935 | 16 |
| 15th Street Bridge Field Measurements | 15th Street Bridge.pdf | dwg. | | 20 |
| Bridge at 15th Street & Waller Creek From 1916 | WLR_15th_Bridge_BDG-5-A-85%7E001.pdf | Office of City Engineer, Austin, TX | August, 1916 | 24 |
| Waller Creek Bridge Survey | 13_094 - Bridge Survey.pdf | dwg. | July 8, 2014 | 25 |
| HERITAGE TREES & VEGETATION | | | | |
| subject | filename | author | date | page # |
| Heritage Trees Site Map | HERITAGE_300sc.pdf | MVVA, dwg. | April 14, 2015 | 34 |
| 8th Street Inlet Study | 2014.12.12_8th St Tunnel Inlet_MVVA Prop Modifications - existing tree verification.pdf | dwg. | December 12, 2014 | 40 |
| 14th Street Trees | dwg Field Report #2 - 2015-03-12 - 14th trees.pdf | dwg. | March 12, 2015 | 43 |
| Waterloo Park Trees | dwg Field Report #2 - photos - flat.pdf | dwg. | | 44 |
| Waller Creek Vegetation Survey | 2014.07.29_LBJWC_Survey.pdf | LBJWC, Ecosystem Design Group | July 29, 2014 | 48 |
| HYDRAULICS & HYDROLOGY | | | | |
| subject | filename | author | date | page # |
| Hydraulics & Hydrology Site Map | HYDROLOGY_300sc.pdf | LimnoTech, MVVA | April 14, 2015 | 54 |
| Cross-Section Data (Digital Only) | 2015 03 02_MVVA_WALLCK HEC-RAS Ver 3 0 Cross-Section Data - MVVA Updates | LimnoTech | March 3, 2015 | |
| Limnotech Section Coordination | MVVA_LIMNO_Section Coordination.pdf | LimnoTech | | 60 |
| Limnotech Program Verification Memo | 2014 12 11_LimnoTech_Program_Verification_Discovery_Memo-1.pdf | LimnoTech | December 11, 2014 | 62 |
| MAINTENANCE & OPERATIONS | | | | |
| subject | filename | author | date | page # |
| Maintenance & Operations Site Map | MAINTENANCE_OPERATIONS_300sc.pdf | MVVA | March 31, 2015 | 84 |
| Maintenance Zones Section | 2015.04.24_Maintenance Zones_UPDATE.pdf | MVVA | April 24, 2015 | 90 |
| Maintenance & Operations Report | 20150701_Final Framework_M&O Report.pdf | ETM | July 7, 2015 | 92 |

| RIPARIAN SLOPES | | | | |
|---|--|-----------------------------|----------------|---------------|
| subject | filename | author | date | page # |
| Riparian Slopes Site Map | RIPARIAN_300sc.pdf | MVVA, AES, LBJWC, LimnoTech | April 14, 2015 | 106 |
| Riparian & Aquatic Habitat Restoration Goals & Strategies | Waller Cr_Framework Plan_AES Appendix.pdf | AES | August 5, 2015 | 112 |
| Initial Soil Sourcing Assessment | Hartsig_Soil & Compost Sources_CCF Appendix Edit.pdf | Olsson Associates | August 5, 2015 | 118 |

| STORMWATER RETROFIT | | | | |
|--|--|-----------------|-------------------|---------------|
| subject | filename | author | date | page # |
| Storm Sewer Outfalls Priorities Table | Storm Sewer Outfalls Priorities Table 2015-01-16.pdf | MVVA, LimnoTech | January 16, 2015 | 122 |
| Stormwater Retrofit: Inline Treatment Assessment Map | STORMWATER-INLINE_300sc.pdf | MVVA, LimnoTech | March 20, 2015 | 124 |
| Inline Storm Drain Treatment Location Assessment | 250 003 - Waller Creek Storm Drain Treatment- 2015.03.31_reduced.pdf | Big Red Dog | March 31, 2015 | 130 |
| Stormwater Outfall Treatment (South) and (North) | 250.003 -SHT 1-2-TREATMENT LOCATE-2015.03.19.pdf | Big Red Dog | February 17, 2015 | 135 |
| Limnotech Inline Treatment Flowchart | 2014.12.01_Inline Treatment Flow Chart.pdf | LimnoTech | December 1, 2014 | 137 |
| Limnotech Final Inline Treatment Memo | 2015-04-27 Final Inline Treatment Memo_LimnoTech.pdf | LimnoTech | April 27, 2015 | 138 |
| Stormwater Retrofit: Landscape Treatment Assessment | STORMWATER-LAND_300sc.pdf | MVVA, LimnoTech | March 20, 2015 | 142 |
| Stormwater Atlas | 2015.02.06_Stormwater 11X17_with pics.pdf | MVVA | | 148 |

| UTILITIES | | | | |
|---|---|----------------------|-------------------|---------------|
| subject | filename | author | date | page # |
| Utilites Site Map | UTILITY_300sc.pdf | MVVA, Big Red Dog | April 20, 2015 | 168 |
| Composite Utility Map Exhibit | 1-7 - 250.003 - Composite Utilities Exhibit.pdf | Big Red Dog | March 23, 2015 | 174 |
| Waller Creek Overall Utility Assessment | 250 003 - Waller Creek Utility Narrative - 2015.05.08.pdf | Big Red Dog | November 20, 2014 | 181 |
| Waller Creek Overhead Utility Exhibit | 250.003 - Waller Creek OU Exhibit 2015-05-07- 1-8.pdf | Big Red Dog | February 11, 2015 | 189 |
| Overall Overhead Utility Exhibit (South & North) | 250.003 - Waller Creek OU Exhibit 2015.05.07.pdf | Big Red Dog | May 7, 2015 | 197 |
| Overhead Utility Assessment | 250.003 - Waller Creek 5th St. OH Memo 2015-05-08.pdf | Big Red Dog | May 8, 2015 | 199 |
| Order of Magnitude | 2015-03-26 - AE Palm Park Order of Magnitude Cost.pdf | Austin Energy | March 26, 2015 | 200 |
| 5th Street Bridge Wastewater Line Conflict and Relocation Options | 250.003 - Waller Creek 5th St. WW Memo Package 2015-05-08.pdf | Big Red Dog | May 8, 2015 | 201 |
| COA Mains to Capitol Complex/AISD Bridge Crossing | Bridge Crossing PP 90.pdf | City of Austin - WPD | October 17, 2014 | 206 |
| COA Mains to Capitol Complex/AISD Structural Set | COA - Mains to Capitol Complex Structural Set 01-14-15.pdf | City of Austin - WPD | January 14, 2015 | 214 |
| Historic Tanks Information and Map | Historic Tanks Info and Map.pdf | City of Austin - GIS | April 16, 2015 | 220 |
| Waller Creek Mouth – Lattice Bridge #2 at Waste Water Line | UTILITIES_2015.06.22_WW Bridge Sections.pdf | MVVA | June 22, 2015 | 227 |

Aquatic Habitats

AQUATIC HABITAT

Aquatic Habitat Site Map
AQUATIC_300sc.pdf

I

PROJECT TYPE

- Do Nothing
- Preservation
- Restoration
- Reconstruction

IN-CHANNEL FEATURES

- E Existing Feature
- Deep Pool
- Cooling Pool
- Wetland Bench
- Proposed Woody Debris
- Boulder Cluster
- Riffle/Pool Complex
- Cross Vane
- Bank Lunker
- Perm. Island
- Gravel Bar
- Existing Exposed Bedrock
- Weir



II



AQUATIC HABITAT

Aquatic Habitat Site Map (cont.)
AQUATIC_300sc.pdf

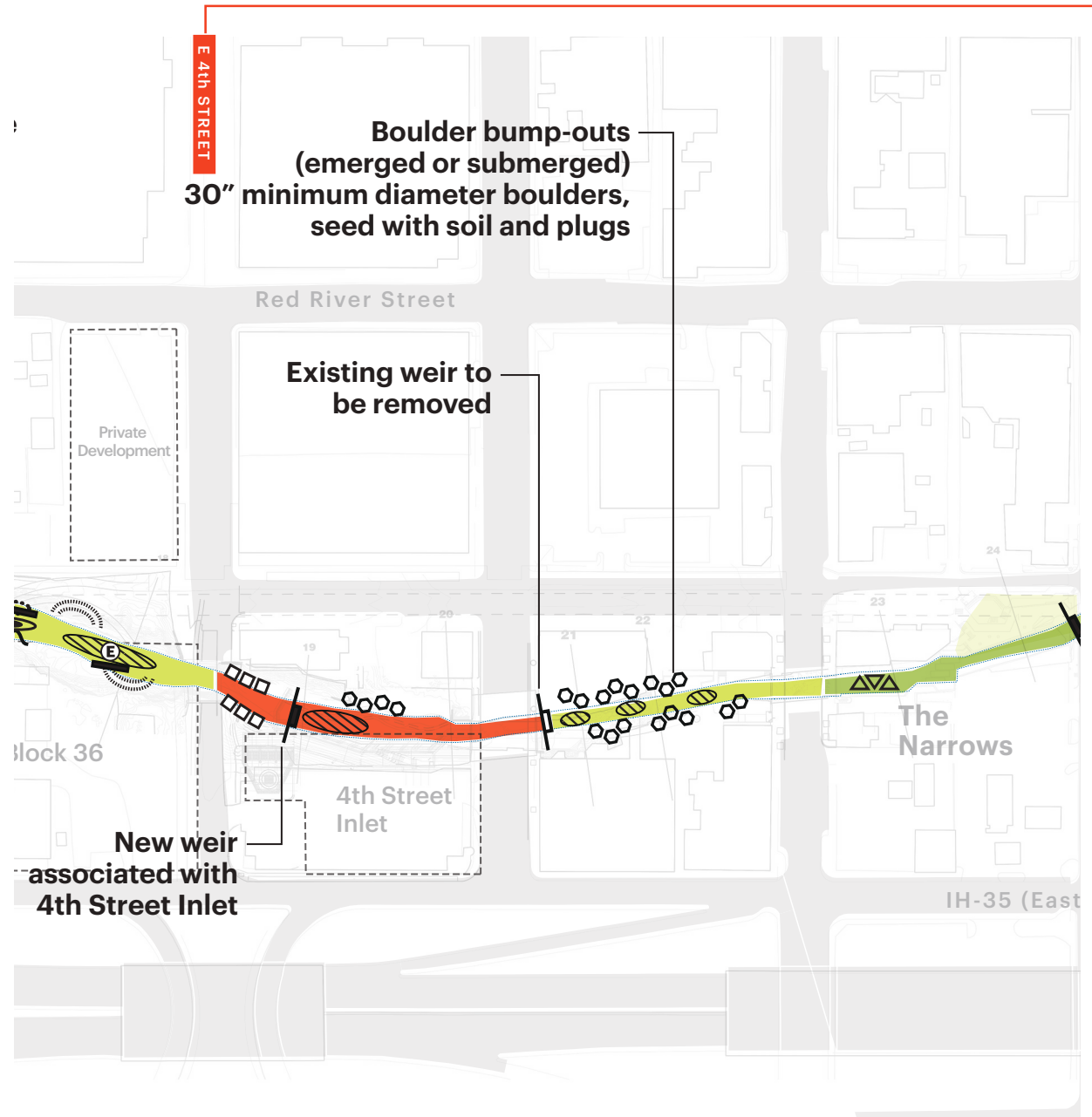
III

PROJECT TYPE

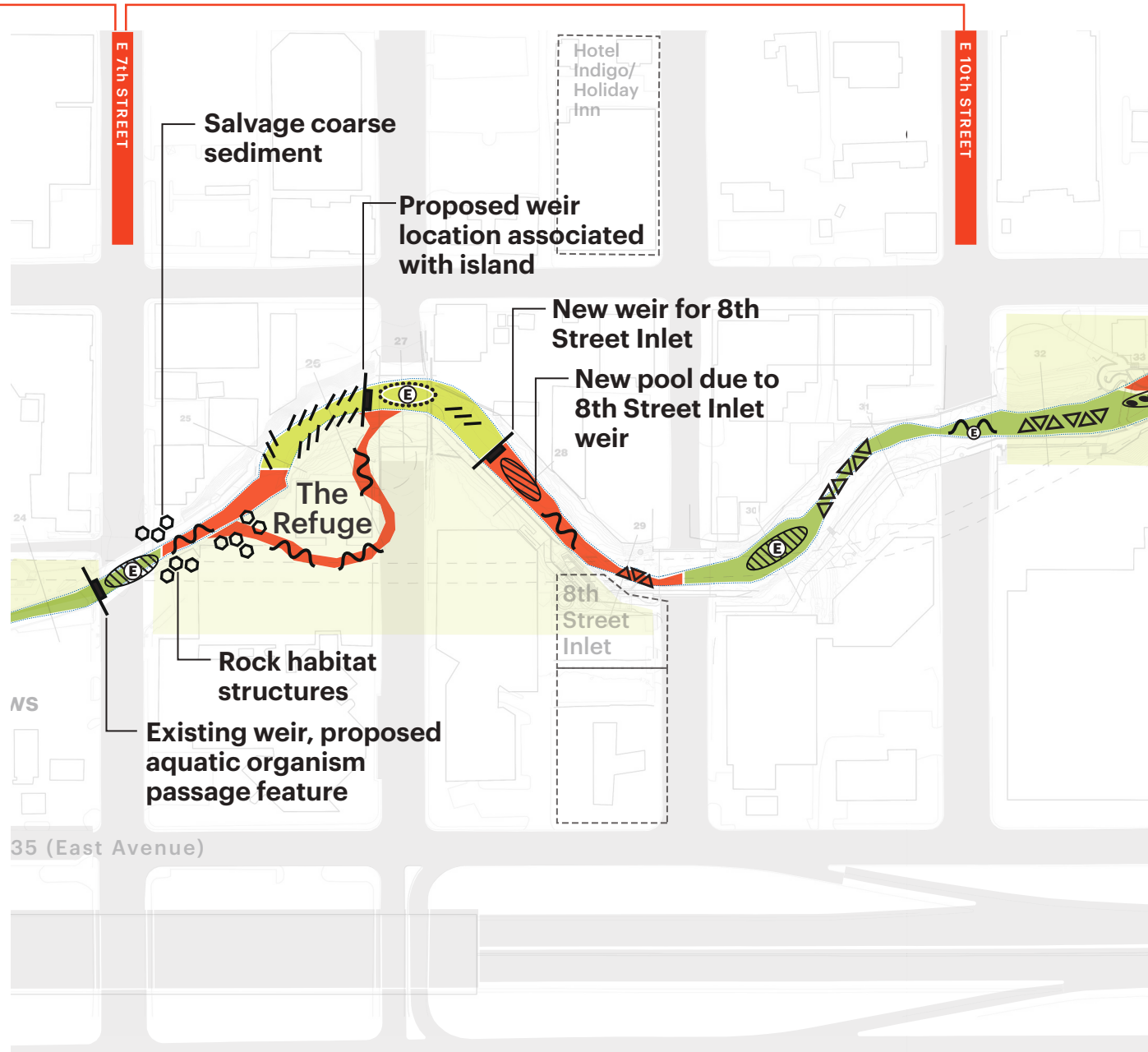
- Do Nothing
- Preservation
- Restoration
- Reconstruction

IN-CHANNEL FEATURES

- E Existing Feature
- Deep Pool
- Cooling Pool
- Wetland Bench
- Proposed Woody Debris
- Boulder Cluster
- Riffle/Pool Complex
- Cross Vane
- Bank Lunker
- Perm. Island
- Gravel Bar
- Existing Exposed Bedrock
- Weir



IV



AQUATIC HABITAT

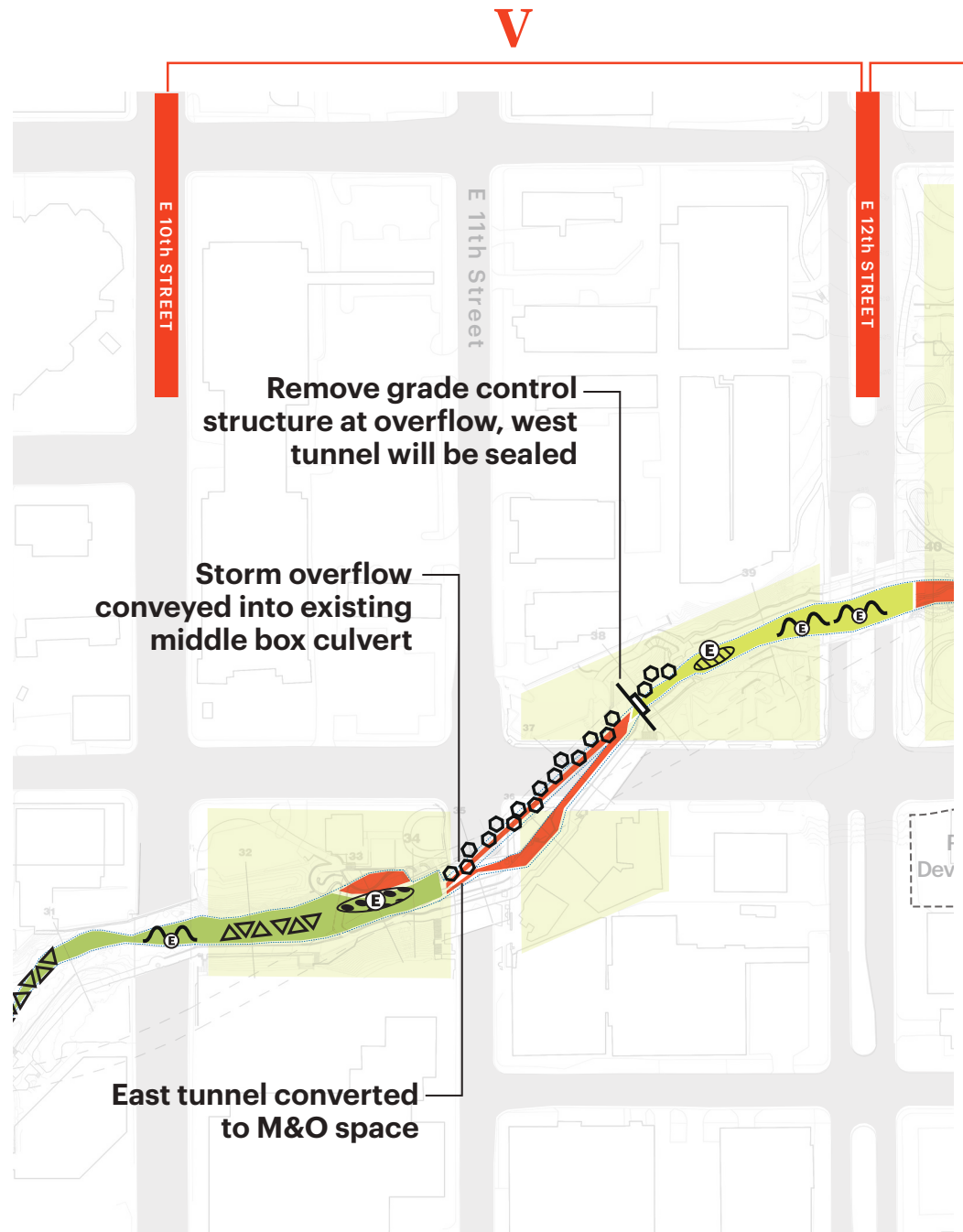
Aquatic Habitat Site Map (cont.)
AQUATIC_300sc.pdf

PROJECT TYPE

- Do Nothing
- Preservation
- Restoration
- Reconstruction

IN-CHANNEL FEATURES

- E Existing Feature
- Deep Pool
- Cooling Pool
- Wetland Bench
- Proposed Woody Debris
- Boulder Cluster
- Riffle/Pool Complex
- Cross Vane
- Bank Lunker
- Perm. Island
- Gravel Bar
- Existing Exposed Bedrock
- Weir



VI



Bridges

BRIDGES

Waller Creek Bridges & Abutments 2014.09.15_Bridge Studies Draft2.pdf



HB Hike & Bike Trail

- Will be replaced by Lattice Bridge in parallel alignment

RR Red River

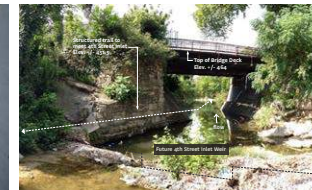
- 1930 (NRHP eligible)
- Proposed trail moves to opposite (west) bank
- Naturalization of east bank

4th Street

- TxDOT request to lower allowable load (e.g. no large trucks)
- Failure of wooden pedestrian path
- Capitol Metro future expansion

6th Street

- See Section D.03
- 1930 - NRHP eligible
- Pedestrian connection would experience frequent flooding if 8th St inlet is not online



CC Cesar Chavez

- Proposed trail moves to opposite (west) bank

3rd Street

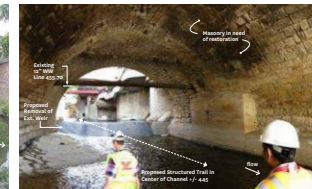
- See Section E4
- Natural gas line on upstream side
- Conflict with existing outfall

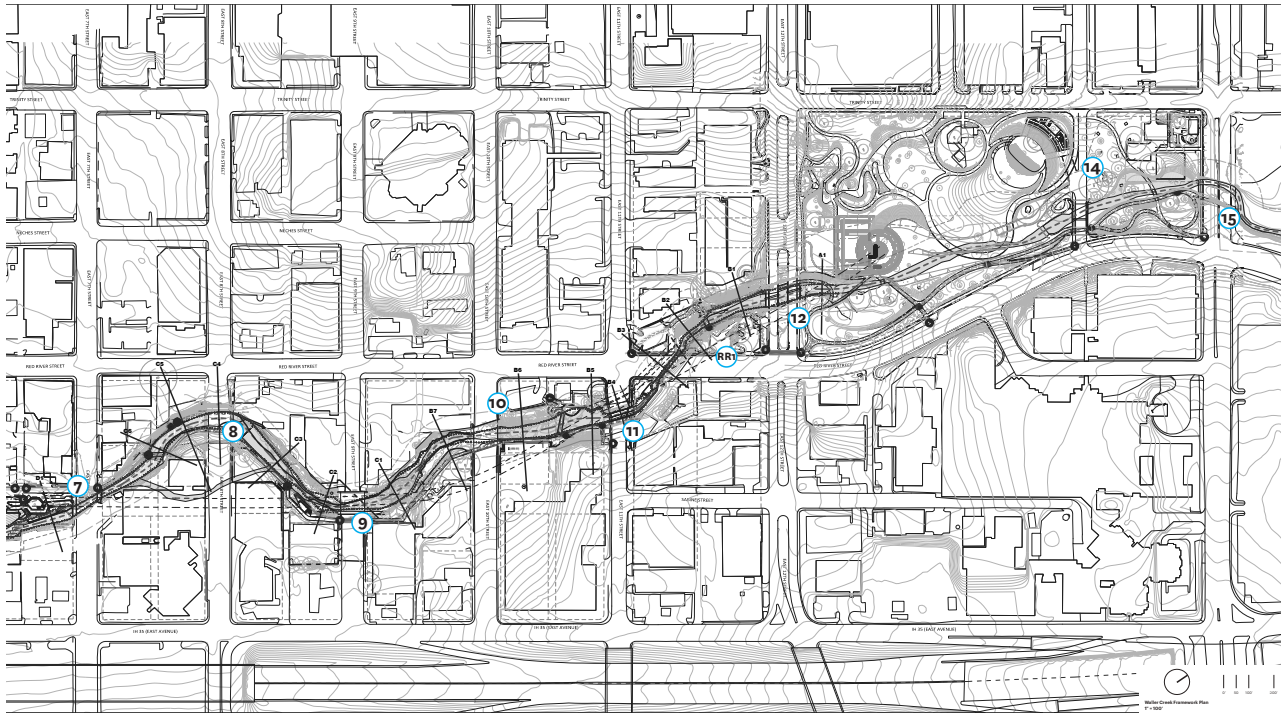
5th Street

- Upstream of 4th Street WCT Inlet Facility
- Trail clearance issues (min 10' vertical clearance for bicycles)

7th Street

- NRHP eligible





8th Street

- Future Island Park
- See Section C.04

10th Street

RR1 Red River betw. 11th / 12th

14th Street

- Currently lawn surface within Waterloo Park
- Proposed re-purposing for limited event-related truck access



9th Street

- Carries major utilities (gas, water)
- No proposed modification; trail will need to cross at street-level

11th Street

- See Section B.4

12th Street

- NWP Eligible

15th Street

- No existing trail connection north to UT Austin



BRIDGES

E. Third Street Bridge Over Waller Creek From 1935 (1-2)
BDG-6-B-68-002-005.pdf

CITY OF AUSTIN, TEXAS

E. THIRD STREET BRIDGE OVER WALLER CREEK

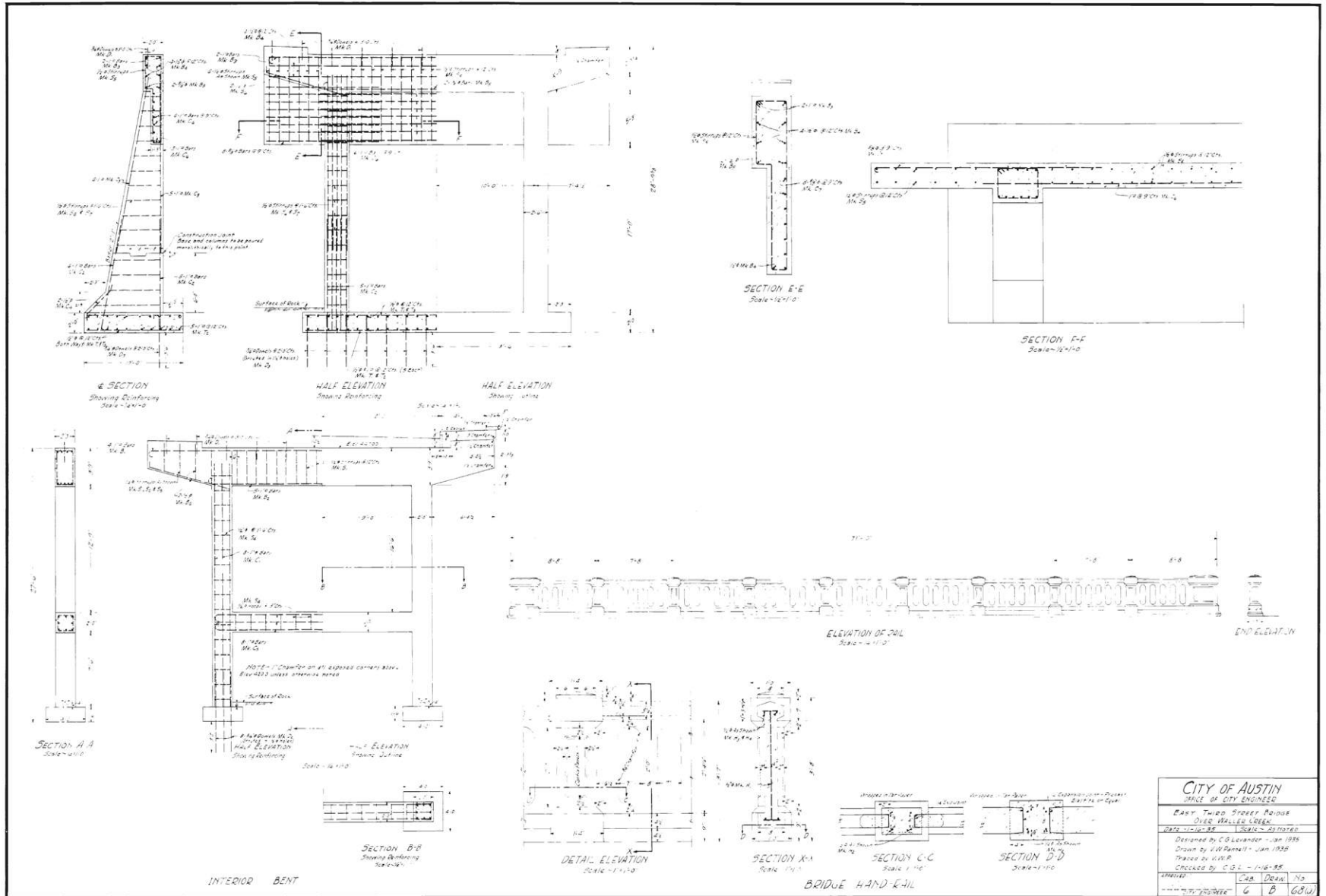
GUITON MORGAN
CITY MANAGER
J. E. MOTHERAL
CITY ENGINEER

—CITY COUNCIL—
TOM MILLER, MAYOR
OSWALD G. WOLF
MAYOR PRO TEM.
C. F. ALFORD
C. M. BARTHOLOMEW
SIMON GILLIS



6-B-68
C.O.A.T.
E. THIRD STREET
BRIDGE OVER
WALLER CREEK

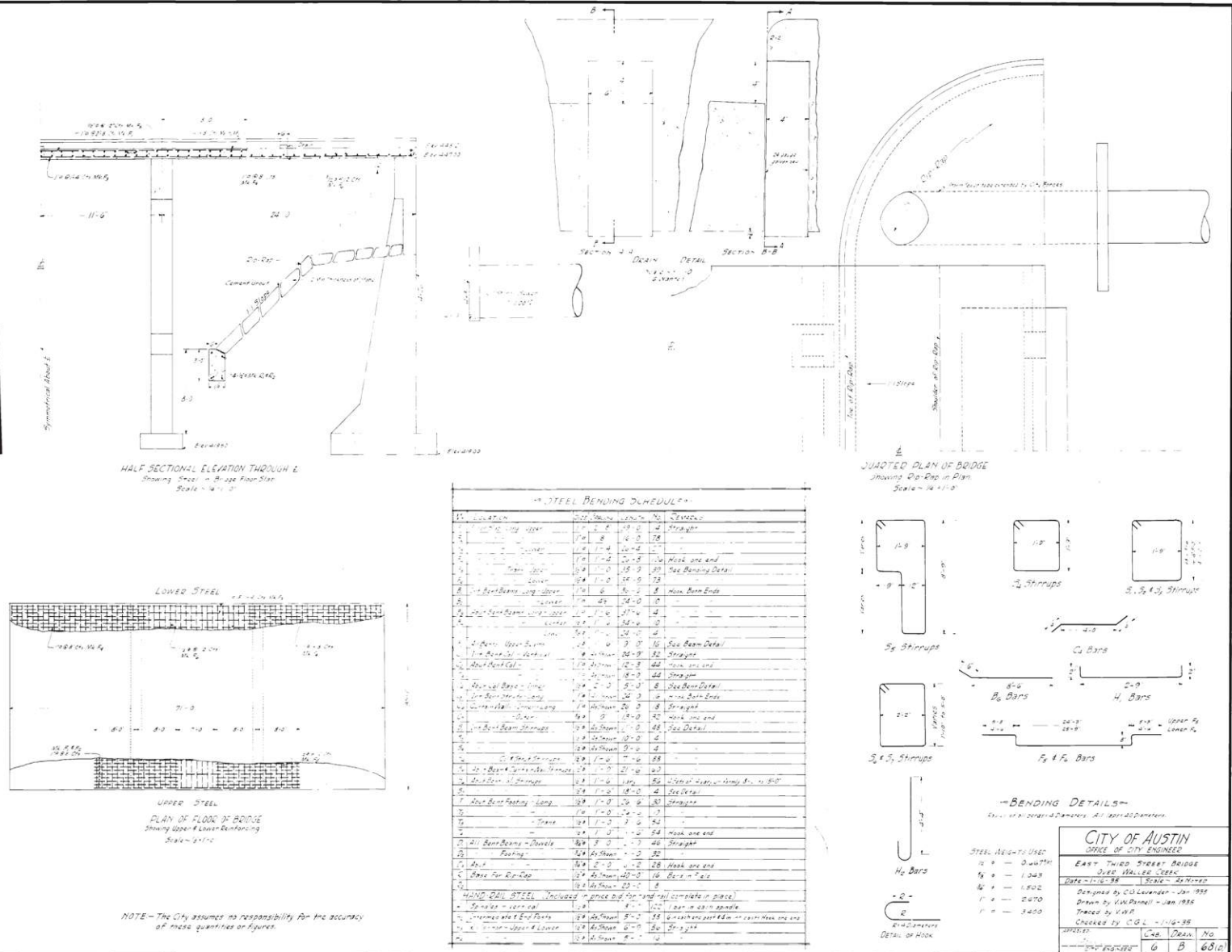
APPROVED: _____
GUITON MORGAN
CITY MANAGER

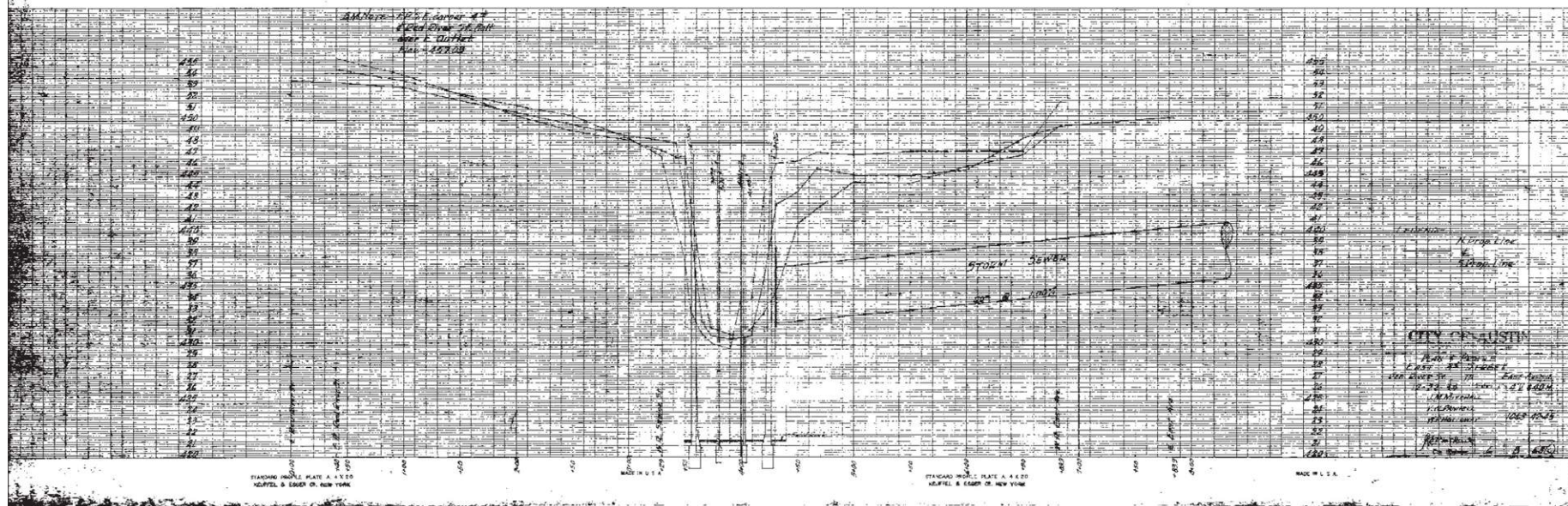
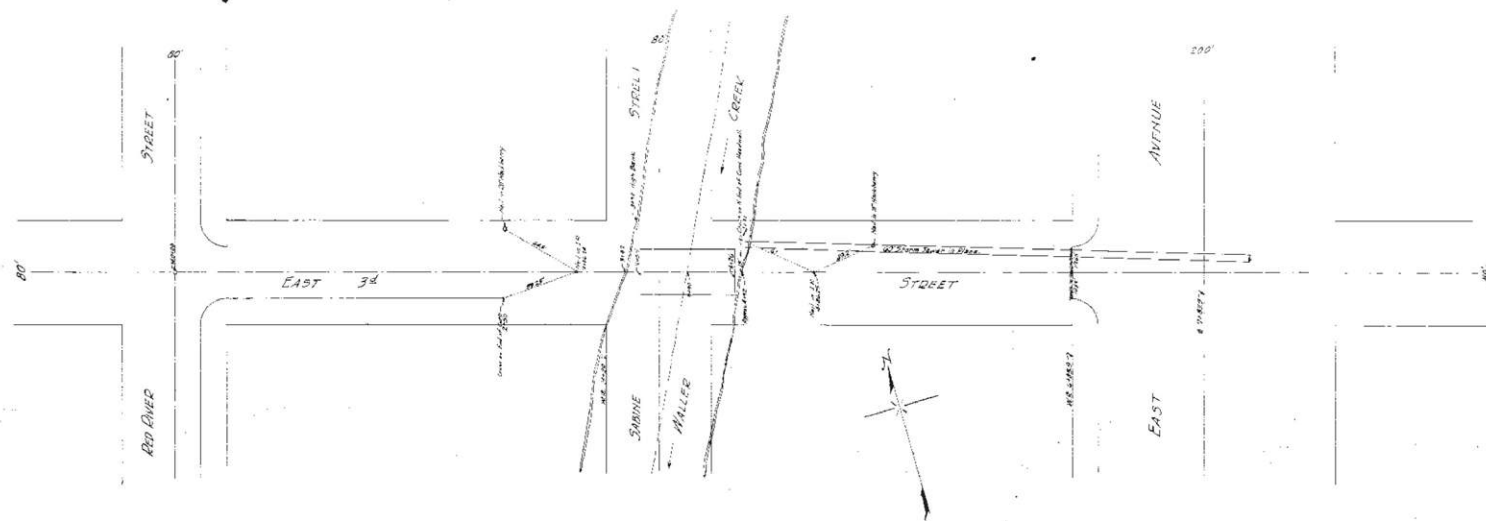


BRIDGES

E. Third Street Bridge Over Waller Creek From 1935 (3-4)
BDG-6-B-68-002-005.pdf

6-B-66-H
UPPER SHOAL
CREEK BRIDGE



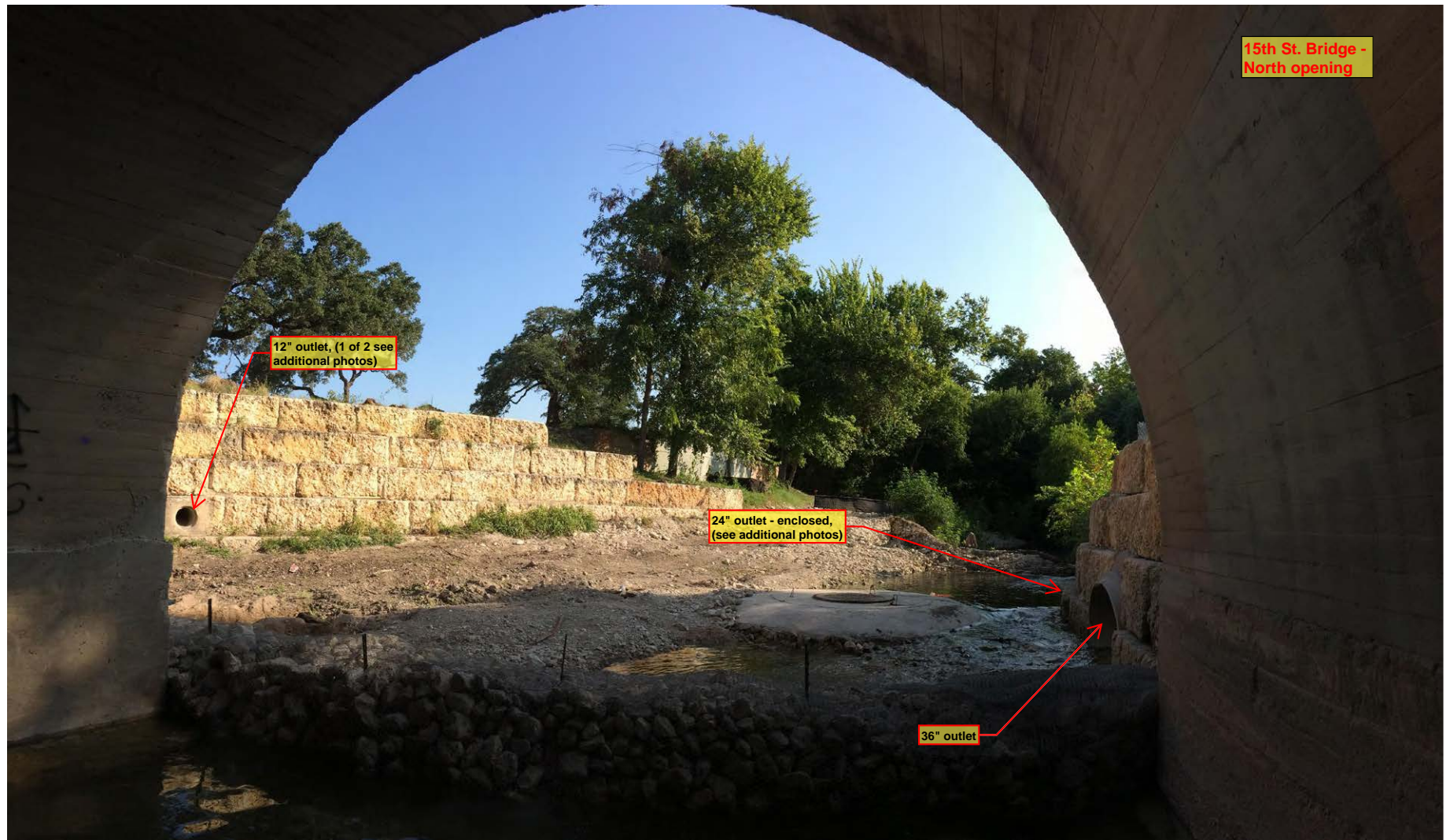


BRIDGES

15th Street Bridge Field Measurements (1-2)

15th Street Bridge.pdf





15th St. Bridge -
North opening

12" outlet, (1 of 2 see
additional photos)

24" outlet - enclosed,
(see additional photos)

36" outlet

BRIDGES

15th Street Bridge Field Measurements (3-4) 15th Street Bridge.pdf



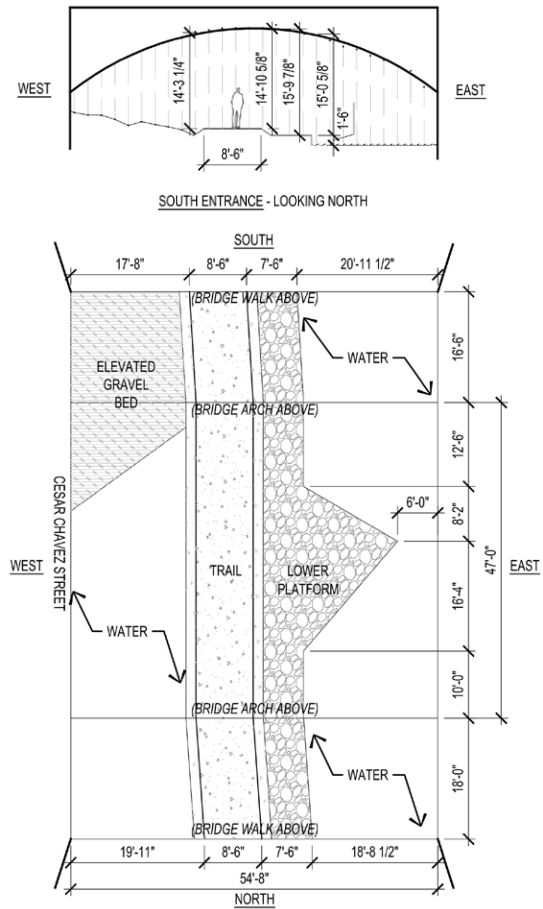


Bridge at 15th Street & Waller Creek From 1916
WLR_15th_Bridge_BDG-5-A-85%7E001.pdf

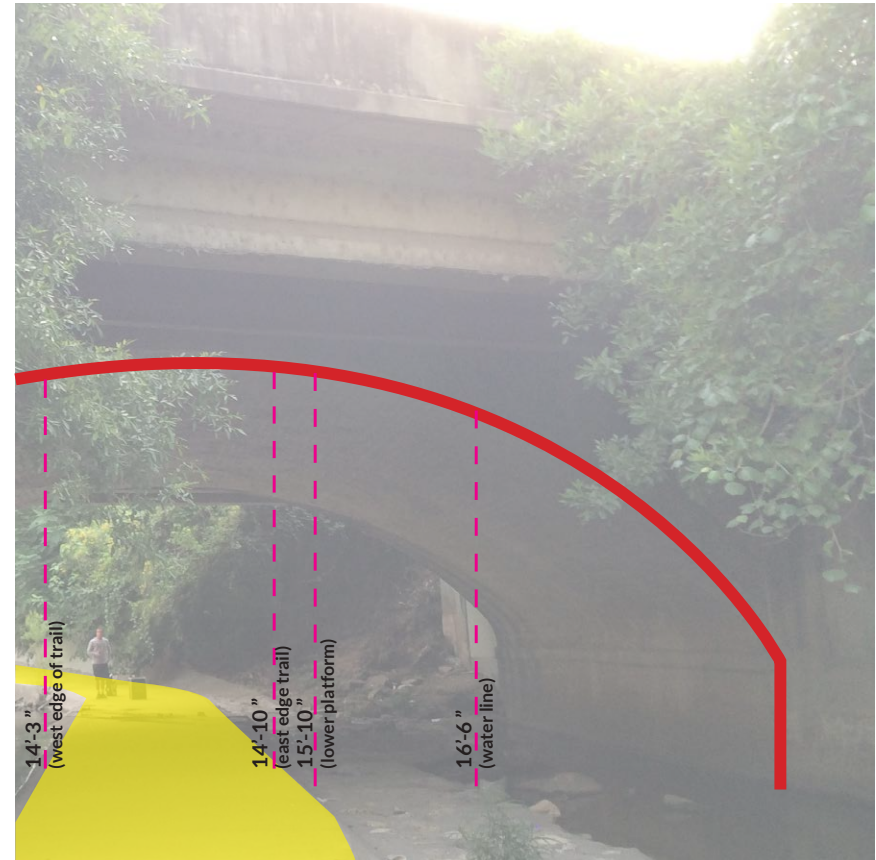


BRIDGES

Waller Creek Bridge Survey (1)
13_094 - Bridge Survey.pdf



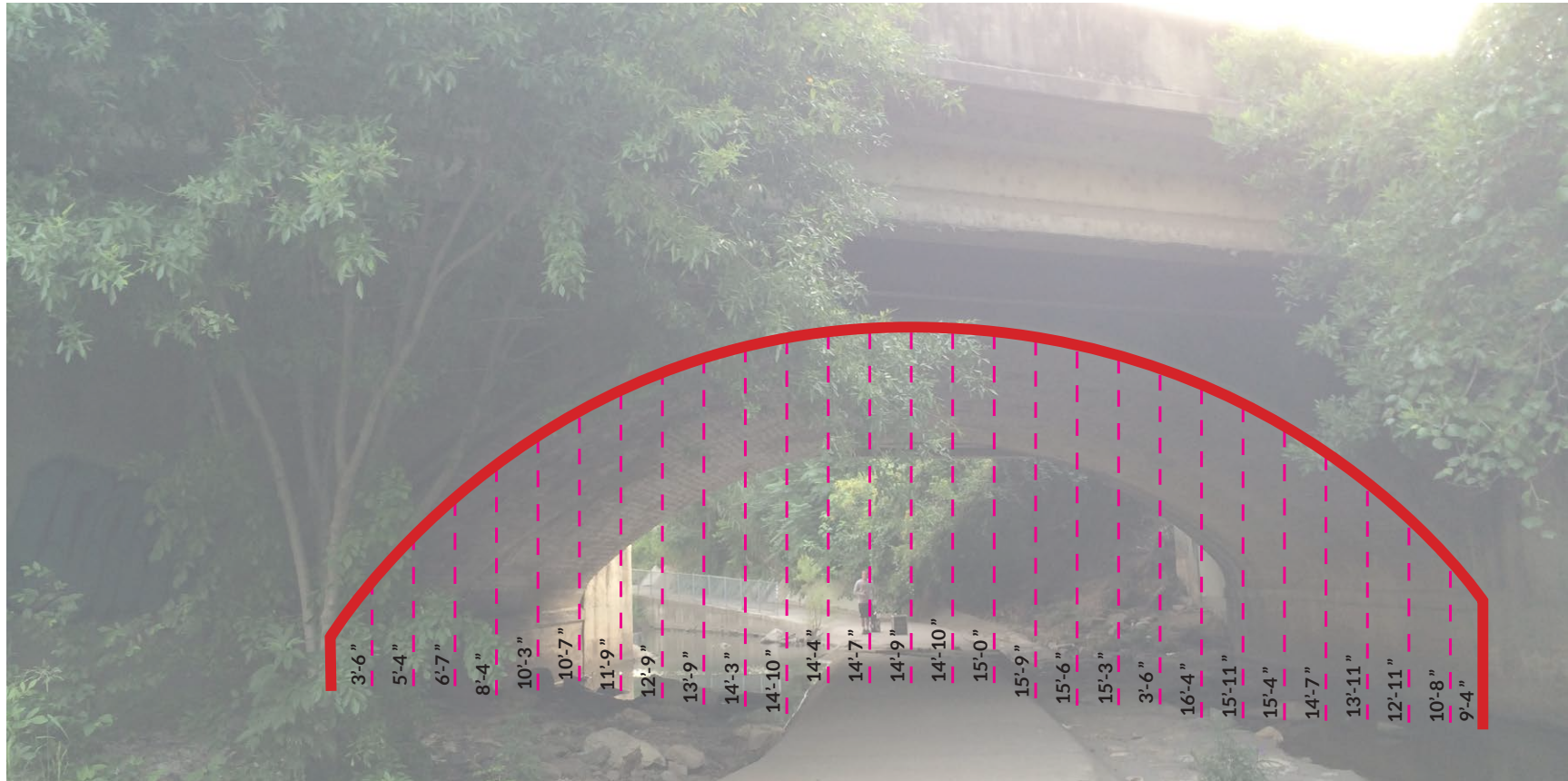
WALLER CREEK_cesar chavez bridge



dwg.

BRIDGES

Waller Creek Bridge Survey (2-3)
13_094 - Bridge Survey.pdf



WALLER CREEK_cesar chavez bridge

dwg.



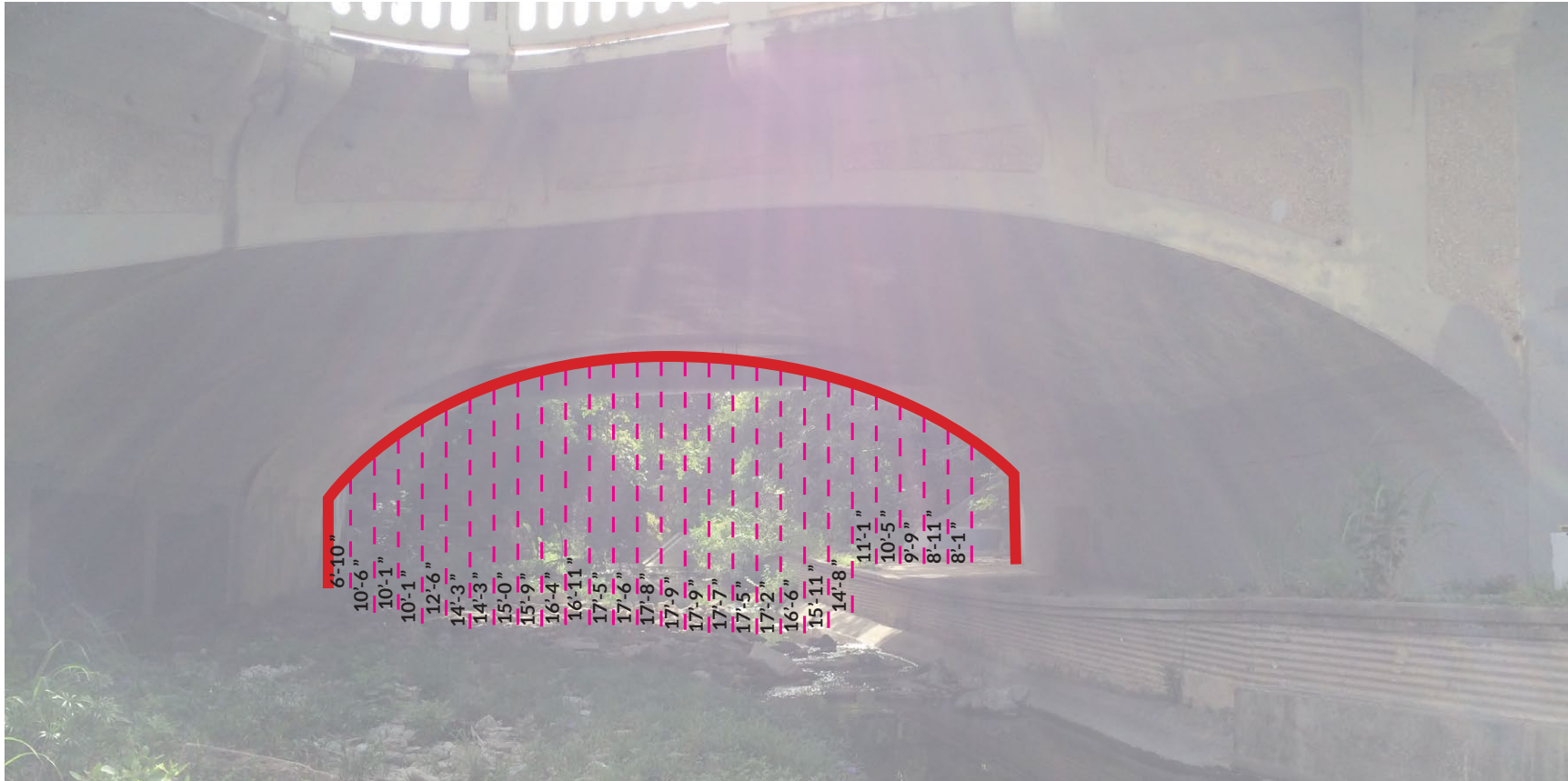
WALLER CREEK_red river bridge



dwg.

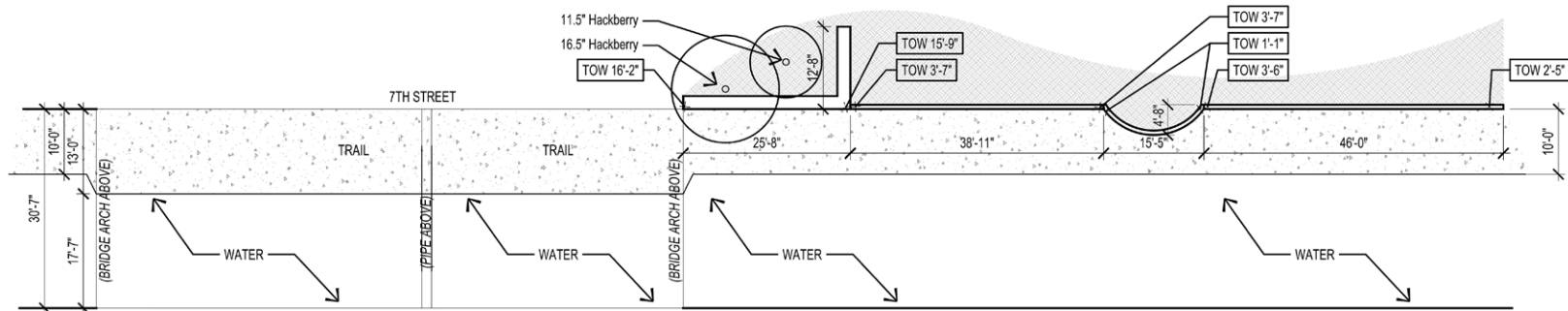
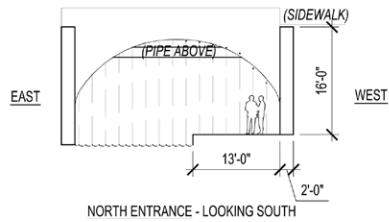
BRIDGES

Waller Creek Bridge Survey (4-5)
13_094 - Bridge Survey.pdf



WALLER CREEK_red river bridge

dwg.



WALLER CREEK_7th bridge

dwg.

BRIDGES

Waller Creek Bridge Survey (6)
13_094 - Bridge Survey.pdf



WALLER CREEK_7th bridge

dwg.

Heritage Trees & Vegetation

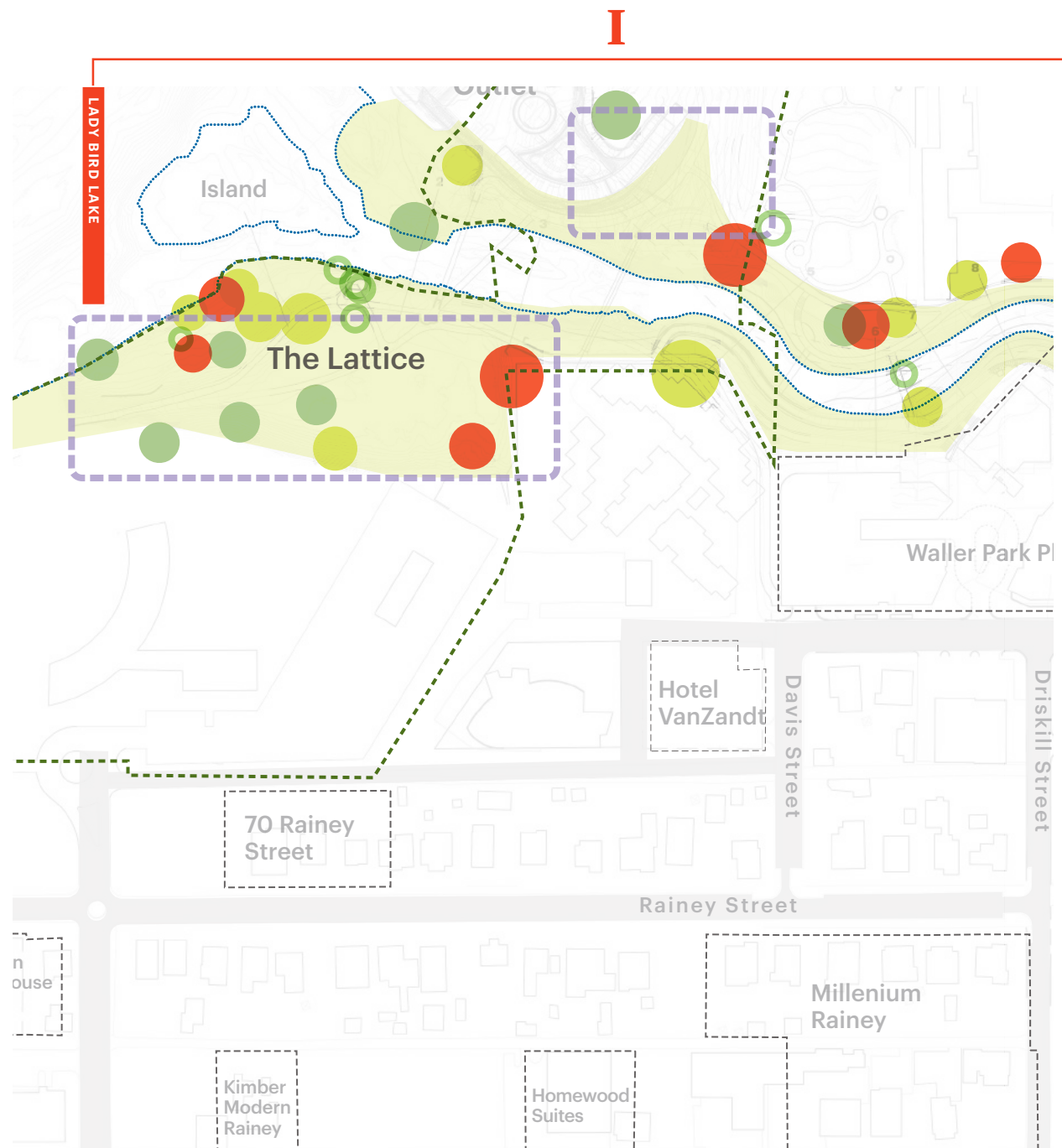
HERITAGE TREES & VEGETATION

Heritage Trees Site Map
HERITAGE_300sc.pdf

ASSESSMENT RATINGS KEY: (Heritage Trees)

- Good- No Apparent Problems
- Fair- Minor Problems
- Poor- Major Problems
- 12"-24" Good
- Park Destination
- PARD Property (GIS)

SOURCE: 2012-2013 ArborPro survey & 2014
dwg graphic conversion.
Evaluation based upon an adaptation of the
Council of Tree and Landscape Appraisers
(CTLA) tree appraisal standards (CTLA, 2000
Guide for Plant Appraisal, 9th Ed.)



II



HERITAGE TREES & VEGETATION

Heritage Trees Site Map (cont.)

HERITAGE_300sc.pdf

III

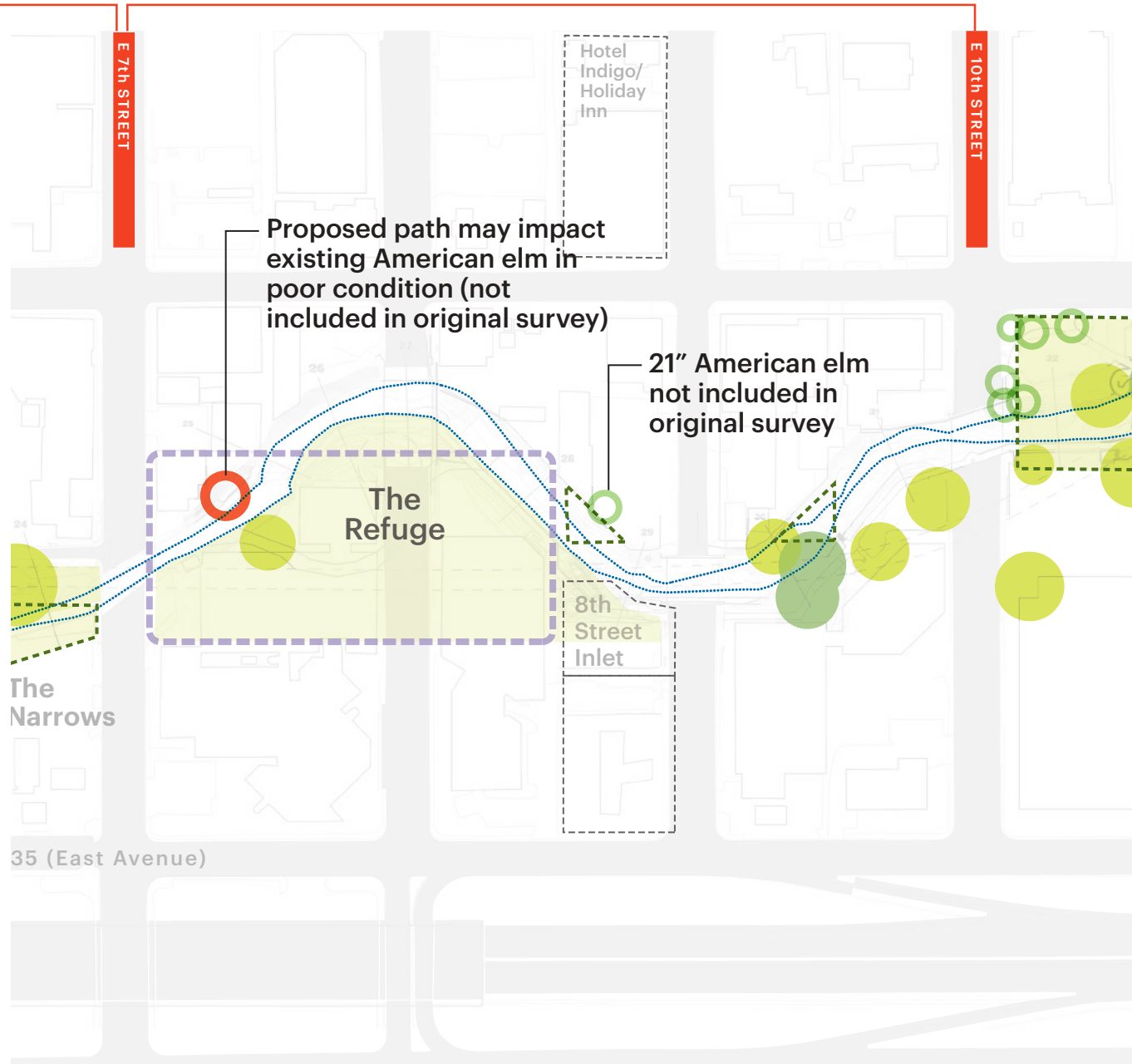
ASSESSMENT RATINGS KEY: (Heritage Trees)

- Good- No Apparent Problems
- Fair- Minor Problems
- Poor- Major Problems
- 12"-24" Good
- Park Destination
- PARD Property (GIS)

SOURCE: 2012-2013 ArborPro survey & 2014
dwg graphic conversion.
Evaluation based upon an adaptation of the
Council of Tree and Landscape Appraisers
(CTLA) tree appraisal standards (CTLA, 2000
Guide for Plant Appraisal, 9th Ed.)



IV



HERITAGE TREES & VEGETATION

Heritage Trees Site Map (cont.)
HERITAGE_300sc.pdf

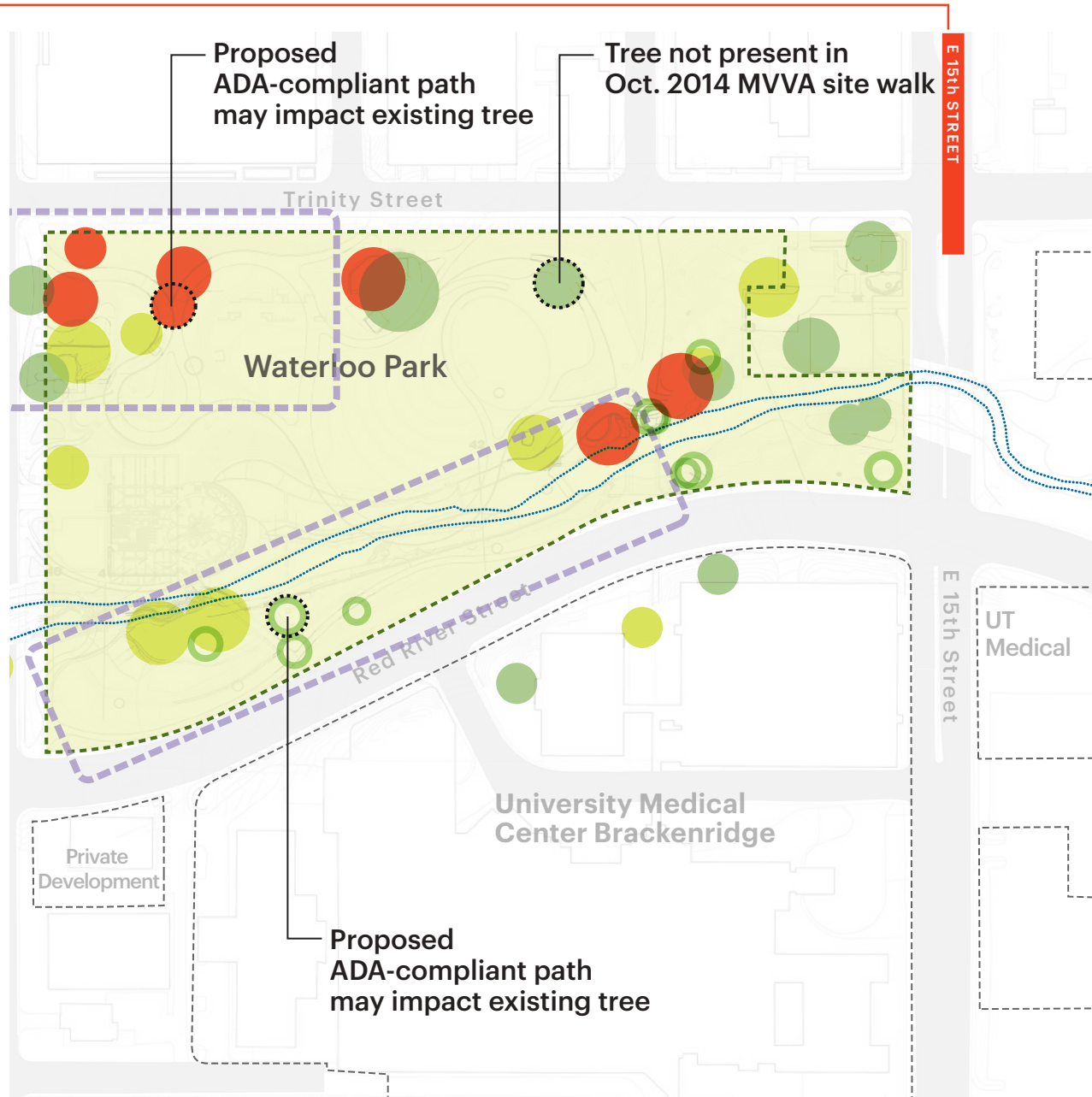
ASSESSMENT RATINGS KEY: (Heritage Trees)

- Good- No Apparent Problems
- Fair- Minor Problems
- Poor- Major Problems
- 12"-24" Good
- Park Destination
- PARD Property (GIS)

SOURCE: 2012-2013 ArborPro survey & 2014
dwg graphic conversion.
Evaluation based upon an adaptation of the
Council of Tree and Landscape Appraisers
(CTLA) tree appraisal standards (CTLA, 2000
Guide for Plant Appraisal, 9th Ed.)



VI

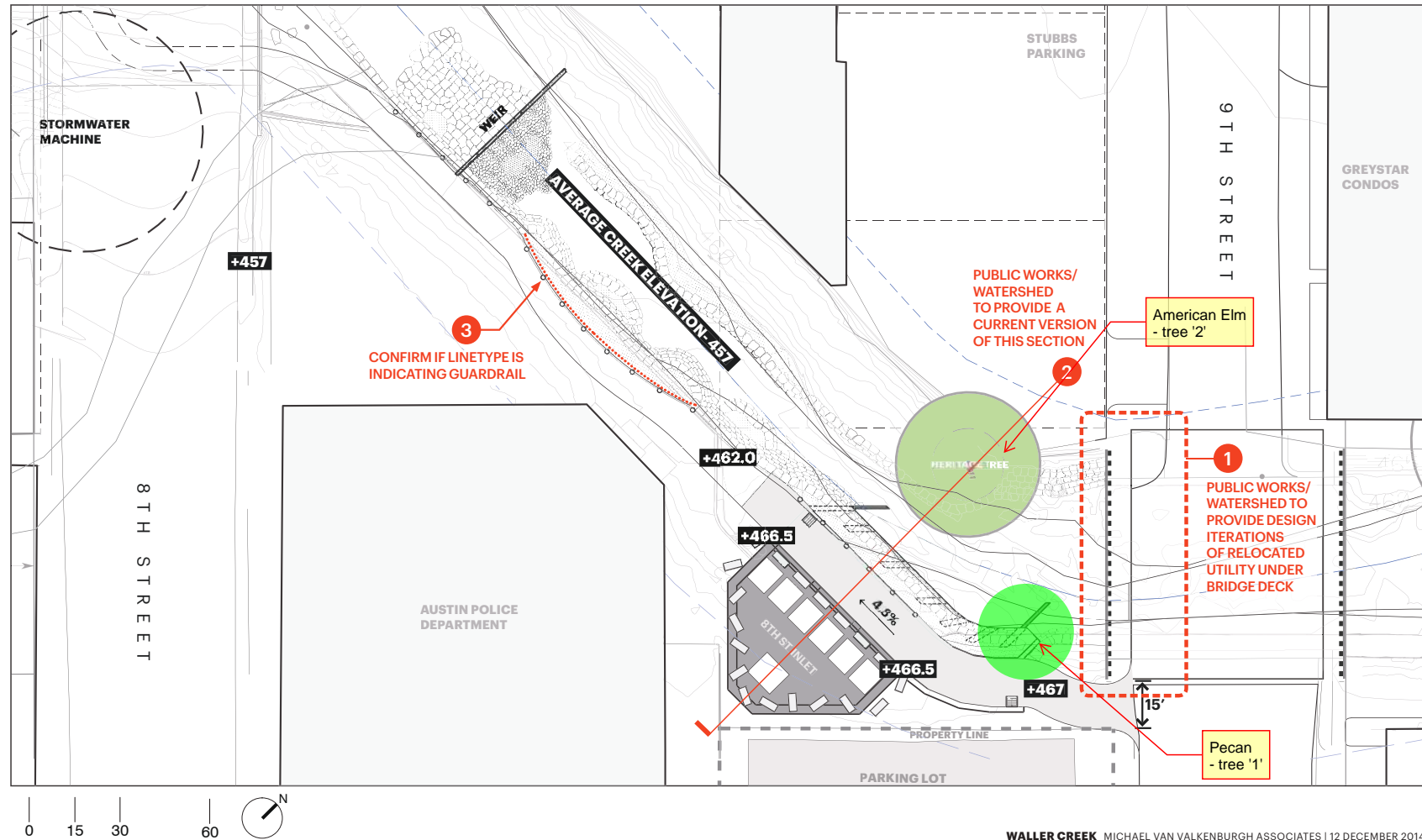


HERITAGE TREES & VEGETATION

8th Street Inlet Study (1-2)

2014.12.12_8th St Tunnel Inlet_MVVA Prop Modifications - existing tree verification.pdf

8TH STREET INLET STUDY - CURRENT PROPOSED



WALLER CREEK MICHAEL VAN VALKENBURGH ASSOCIATES | 12 DECEMBER 2014

Pecan - Tree '1'
- Unknown caliper size.
- Undocumented assessment
in 2013 CBD Tree Inventory



HERITAGE TREES & VEGETATION

8th Street Inlet Study (3)

2014.12.12_8th St Tunnel Inlet_MVVA Prop Modifications - existing tree verification.pdf

American Elm - Tree '2'
- 21" caliper size. (unconfirmed by dwg.)
- Assessed as 'fair' in 2013 CBD Tree Inventory



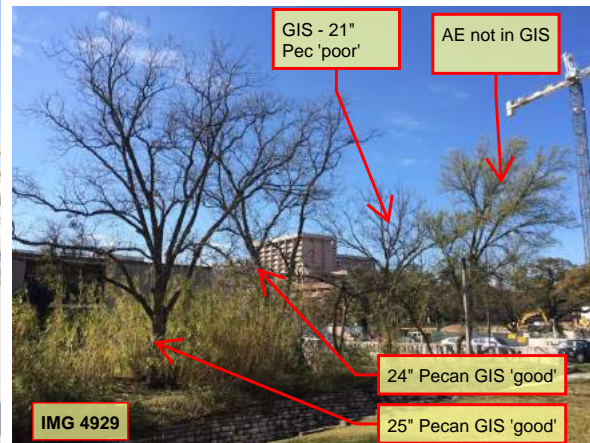
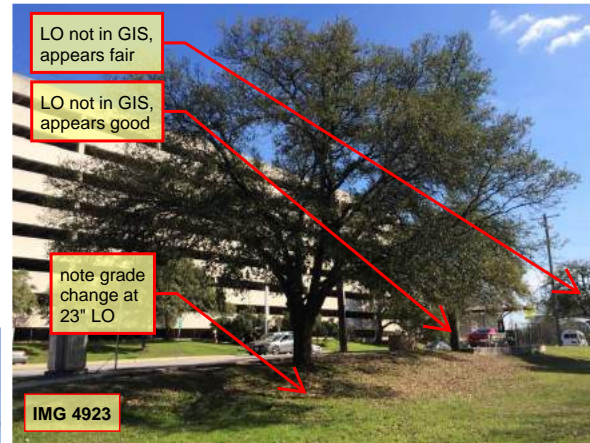
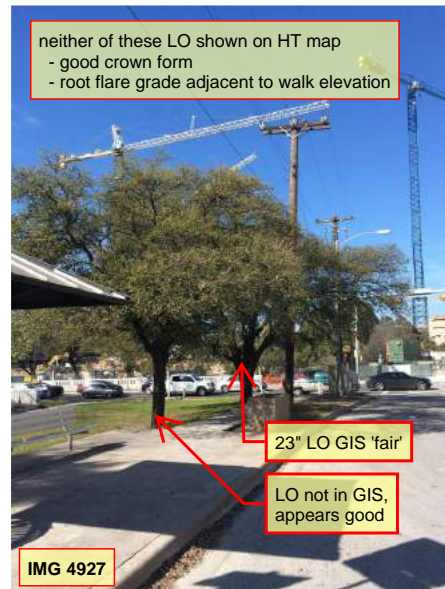
dwg Field Report #2 - 2015-03-12 - 14th trees.pdf



HERITAGE TREES & VEGETATION

Waterloo Park Trees (1-2)

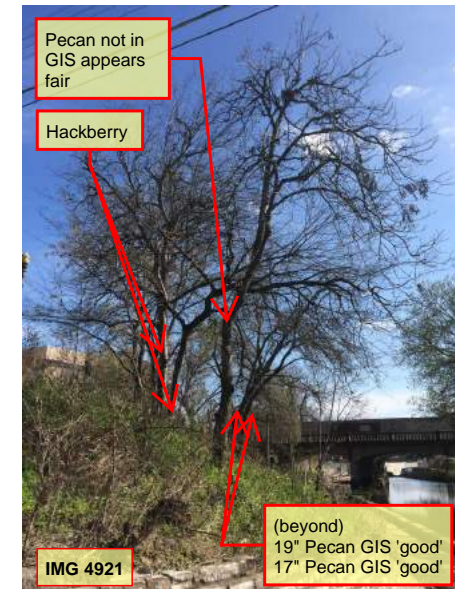
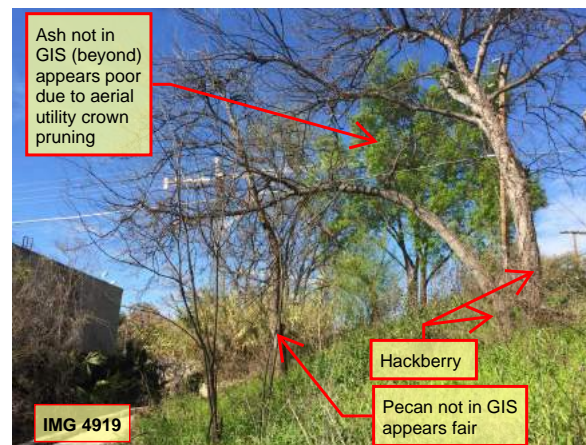
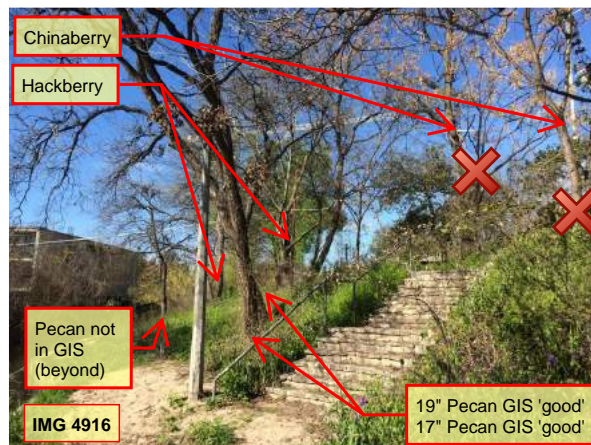
dwg Field Report #2 - photos - flat.pdf



WC CORRIDOR FRAMEWORK_Waterloo Trees Park 1 of 4

912b congress ave. | austin, texas, 78701 | 512.320.0668 | www.studiodwg.com

dwg.



WC CORRIDOR FRAMEWORK_Waterloo Trees Park 2 of 4

912b congress ave. | austin, texas, 78701 | 512.320.0668 | www.studiodwg.com

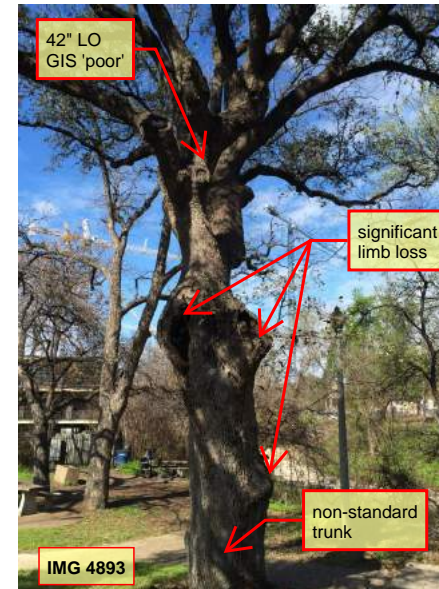
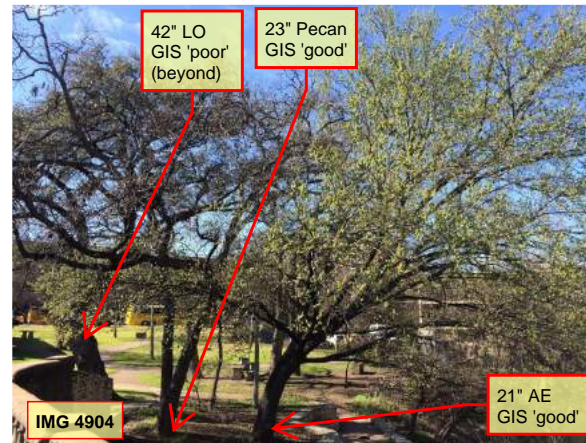
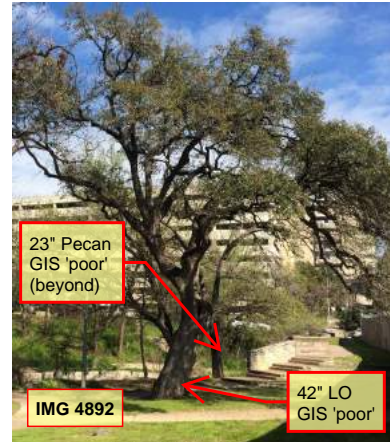
dwg.

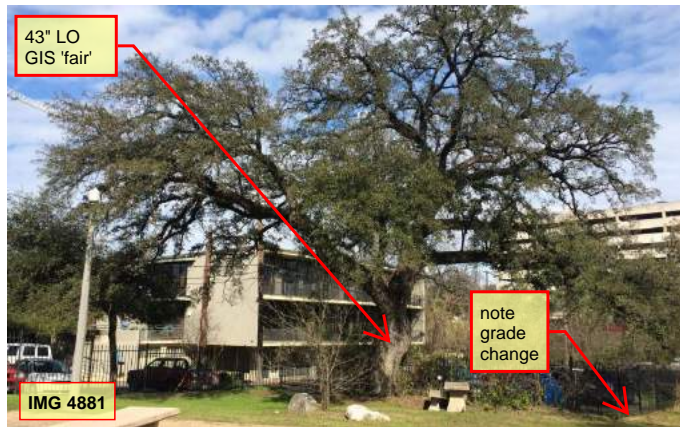
HERITAGE TREES & VEGETATION

Waterloo Park Trees (3-4)
dwg Field Report #2 - photos - flat.pdf

NOTE:

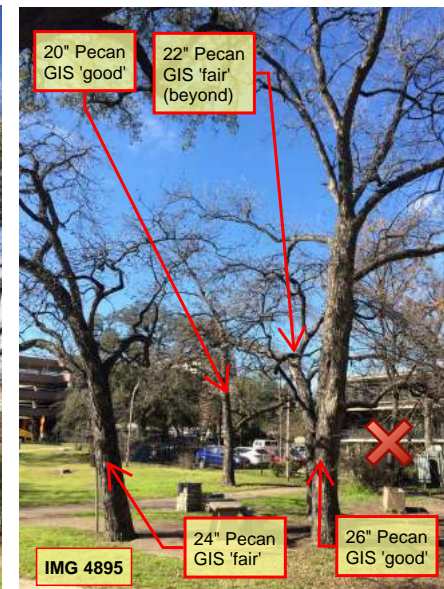
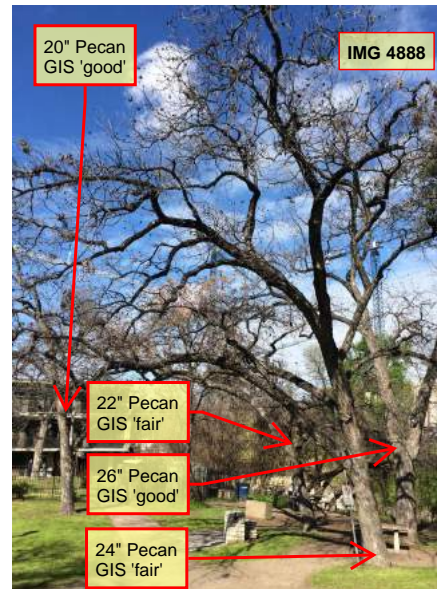
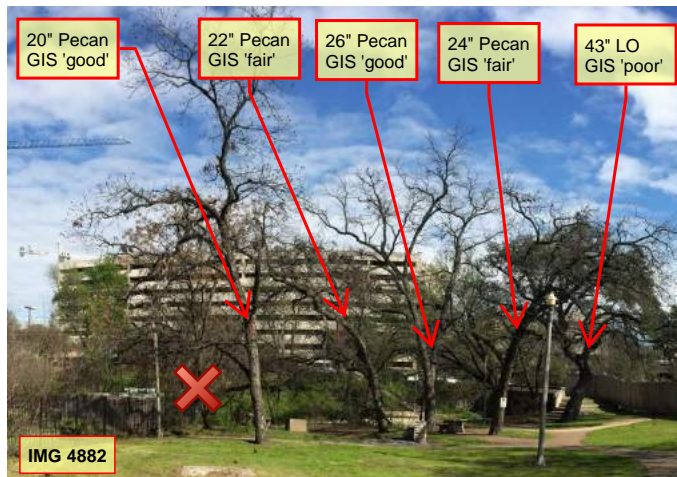
Grade at base of tree trunks (West bank)
is too high and burying root flare - would
recommend lowering grade on these





NOTE:

Grade at base of tree trunks (West bank)
is too high and burying root flare - would
recommend lowering grade on these

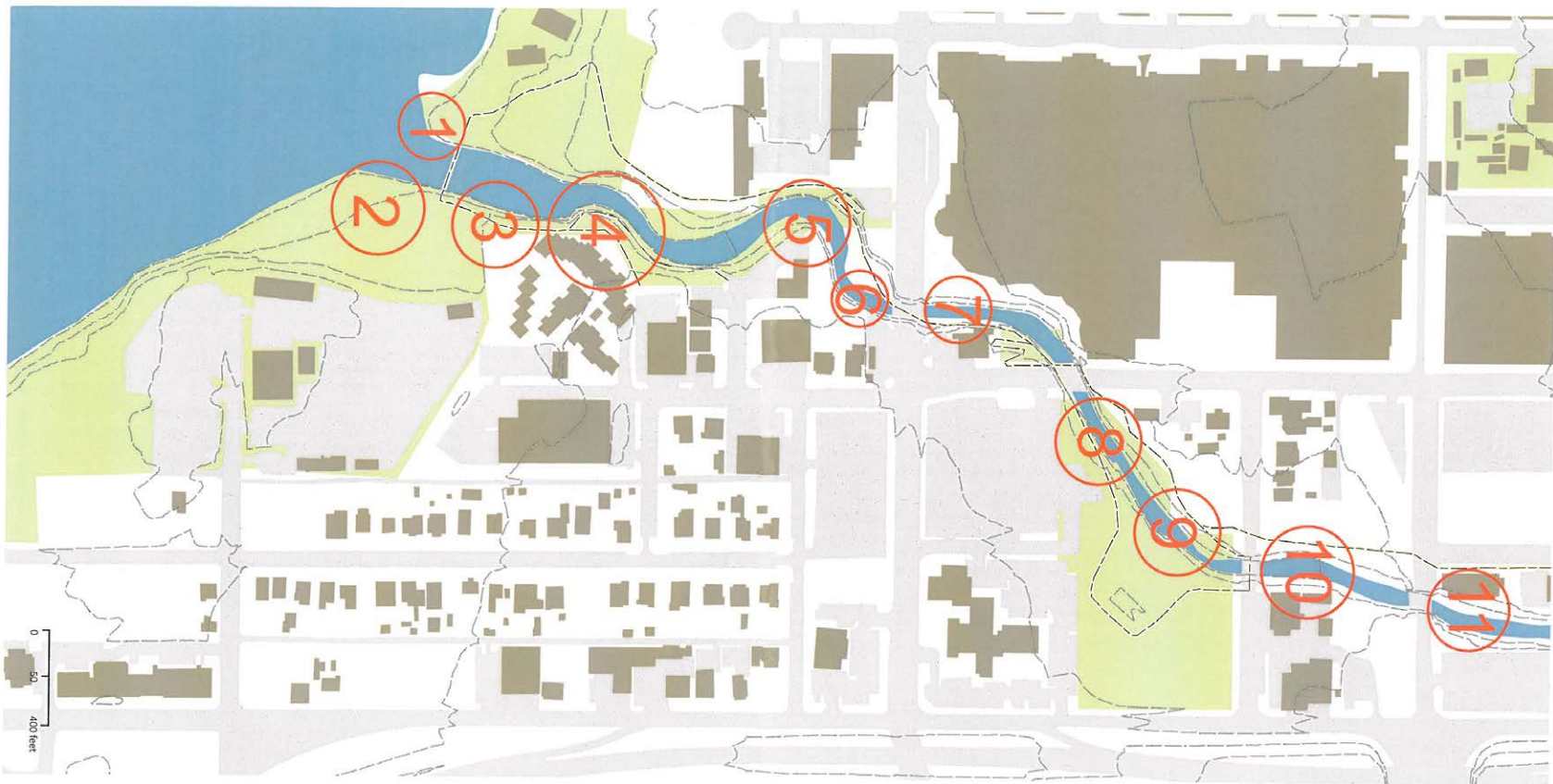


HERITAGE TREES & VEGETATION

Waller Creek Vegetation Survey (1-2)
2014.07.29_LBJWC_Survey.pdf

Waller Creek Vegetation Survey
07/10/14
Lake to 5th street

**ECOSYSTEM
DESIGN GROUP**
LADY BIRD JOHNSON WILDFLOWER CENTER

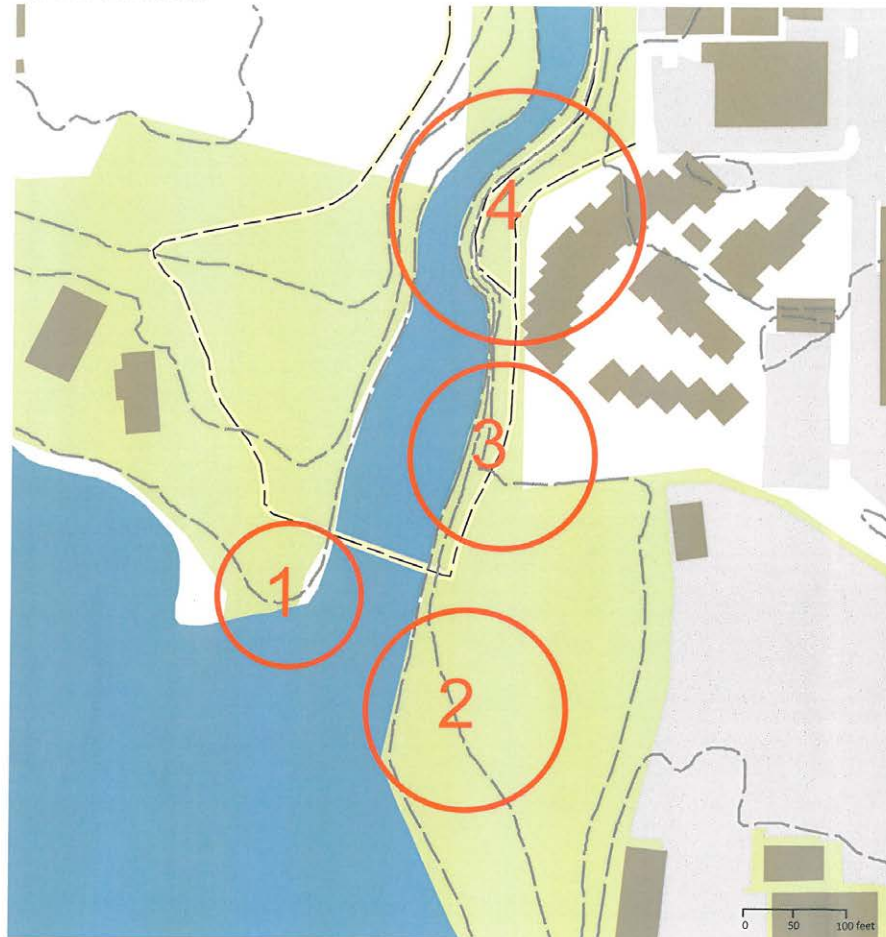


Waller Creek Vegetation Survey

07/10/14

Lake to 5th street

**ECOSYSTEM
DESIGN GROUP**
LADY RUD JOHNSON WILDFLOWER CENTER



| |
|--|
| <p>1. Overstory - 80-100% cover - dominant: black willow, hackberry <i>-bald cypress, sycamore, cottonwood, american elm, pecan</i> Midstory - cover - dominant: hackberry <i>-mulberry, ash sp., box elder, Chinese tallow, chinaberry, giant reed, virginia creeper, grape sp., poison ivy</i> Groundcover - cover - dominant: <i>-elephant ear at edge/in channel, Ruellia caerulea</i> Litter - Notes: bois d'arc at SE side of bridge, flameleaf sumac on east of bridge</p> |
| <p>2. Overstory - cover - dominant species: black willow, hackberry <i>-bald cypress, sycamore, cottonwood, american elm, pecan</i> Midstory - cover - dominant: acer negundo, poison ivy, mustang grape <i>-Chinese photinia, cherry laurel, American elm, chinaberry, black willow, hackberry, green ash, bois d'arc, red mulberry, snailseed, virginia creeper, old man's beard</i> Groundcover - <20% cover - dominant: <i>-Virginia wildrye, straggler daisy, elephant ear, annual marsh elder, ruellia, giant ragweed</i> Litter - 75-100% cover Notes: bank slope, wooded area is narrow, less than 20' in some areas</p> |
| <p>3. Overstory - cover - dominant: hackberry Midstory - cover - dominant: hackberry <i>-retama, gum elastic, mustang grape, poison ivy, snailseed</i> Groundcover - <20% cover - dominant: straggler daisy, toothed spurge Litter - 75-100% Notes: slopes need stabilizing</p> |
| <p>4. Overstory - 75-100% cover - dominant: hackberry <i>-American elm, sycamore, cottonwood, chinaberry</i> Midstory - cover - dominant species <i>-grape, chinaberry, hackberry, Japanese ligustrum, American elm, gum bumelia, cherry laurel, pecan, golden rain tree, red mulberry, loquat, virginia creeper</i> Groundcover - <10% cover - dominant: poison ivy <i>-snailseed, Briton's wild petunia along water</i> Litter - 50-75% Notes: giant reed on west bank at sewer line, steep slope, no transition at top</p> |

HERITAGE TREES & VEGETATION

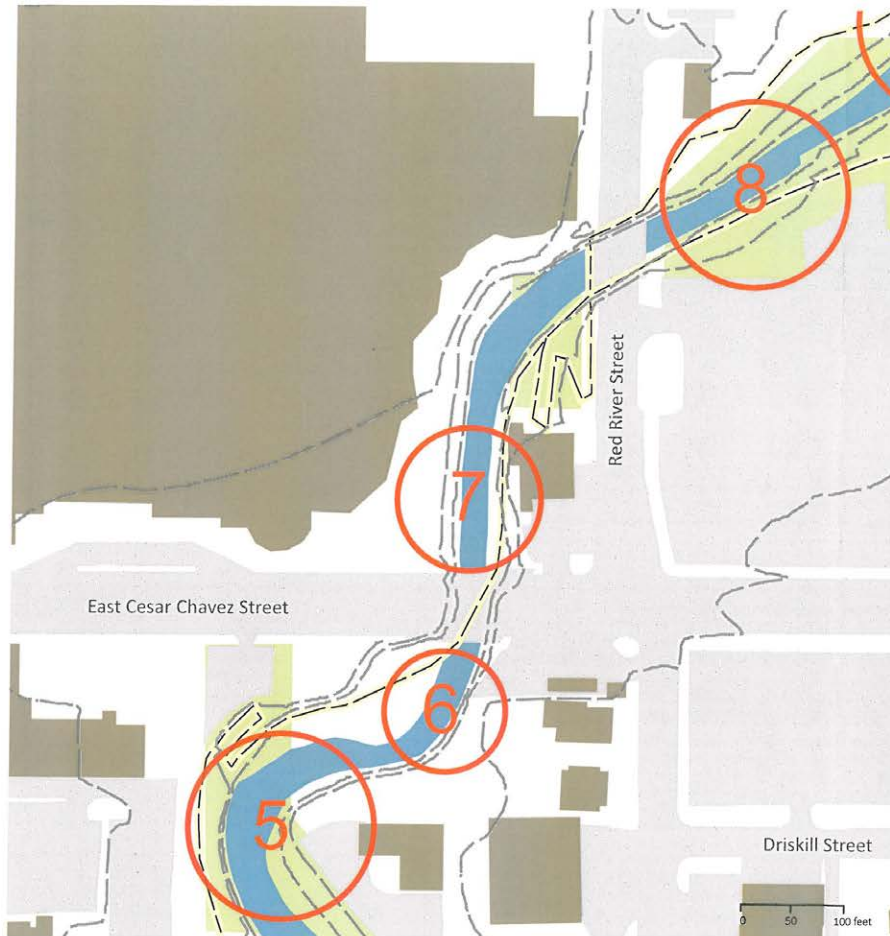
Waller Creek Vegetation Survey (3-4)
2014.07.29_LBJWC_Survey.pdf

Waller Creek Vegetation Survey

07/10/14

Lake to 5th street

**ECOSYSTEM
DESIGN GROUP**
LADY RIND JONATHAN WILDFLOWER CENTER



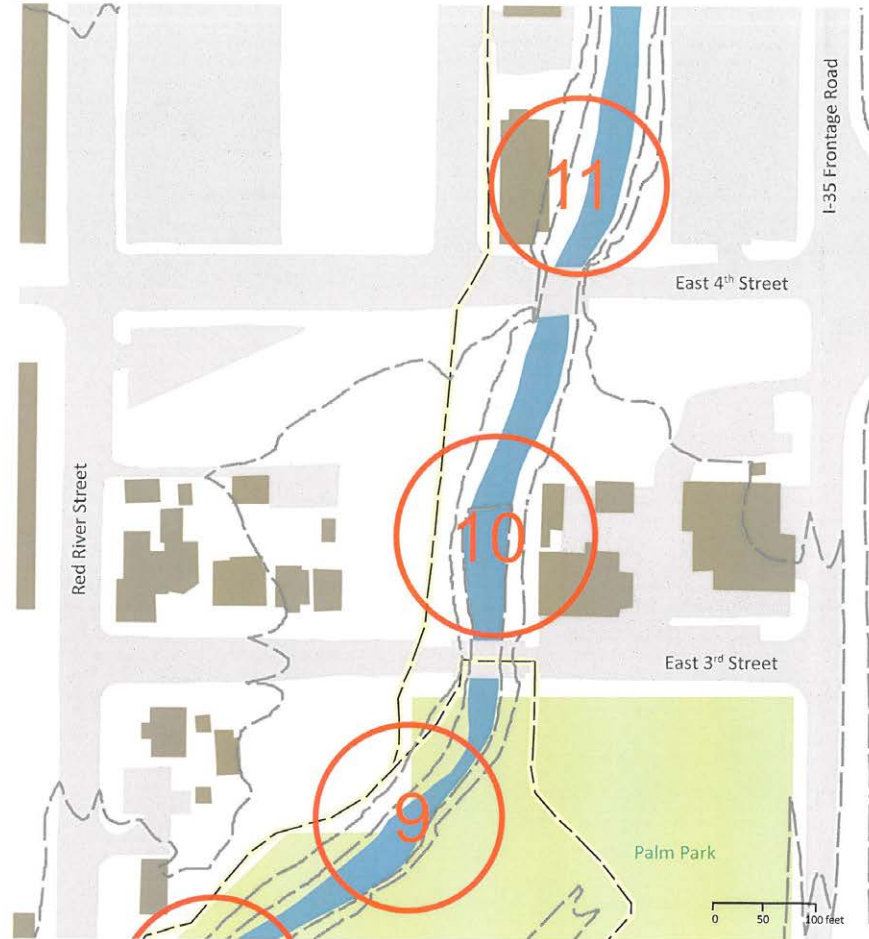
5. Overstory - 75% cover - dominant: American elm
-cottonwood, box elder, chinaberry, golden rain tree, huisache, sycamore
Midstory - % cover - dominant: young bald cypress
- chinaberry, Japanese ligustrum, huisache, golden rain tree, alianthus?
Groundcover - <10% cover - dominant: poison ivy
-giant reed on west bank
Litter - 50%
Notes: on rock wall : river fern, holly fern, maidenhair fern, golden rain tree abundant. block wall threatened by trees growing between blocks. creek bed has Britton's wild petunia and dallis grass, green ash, giant ragweed.
6. Overstory - % cover - dominant: willow, chinaberry, pecan
-hackberry, american elm, sycamore, box elder, ligustrum
Midstory - cover - dominant:
- box elder, chinaberry, ligustrum, willow, hackberry
Groundcover - % cover - dominant:
-Britton's wild petunia, giant ragweed
Litter -
Notes: near Cesar Chavez, box elder becomes more dominant in overstory with willow, while chinaberry is in the understory.
7. Overstory - % cover - dominant: chinaberry
-golden rain tree, American elm, golden rain tree, ligustrum, mulberry
Midstory -% cover - dominant:
- giant reed, golden rain tree, ailanthus, poison ivy, english ivy
Groundcover - % cover - dominant:
-Britton's wild petunia, johnson grass, elephant ear, papyrus, ludwigia
Litter -
Notes: in channel: elephant ear, Britton's wild petunia, papyrus sedge, vasey grass.
8. Overstory - 60-70% cover - dominant:
-pecan, American elm, walnut, hackberry, chinaberry
Midstory - % cover - dominant:
- chinaberry, golden rain tree, red mulberry,
Groundcover - 50-70% cover - dominant: Britton's wild petunia, giant ragweed
-
Litter -
Notes:

Waller Creek Vegetation Survey

07/10/14

Lake to 5th street

**ECOSYSTEM
DESIGN GROUP**
LADY BIRD JOHNSON WILDFLOWER CENTER



9. Overstory - 60-80% cover - dominant:

-chinaberry, pecan, American elm, black willow, pecan

Midstory - 40-60% cover - dominant:

- tree of heaven, willow, American elm, white leadtree, huisache, hackberry, pecan, red mulberry, green ash, trumpet creeper, chinaberry

Groundcover - % cover - dominant:

-Britton's wild petunia, giant ragweed, elephant ear, poison ivy, trumpet creeper, poison ivy, japanese honeysuckle on black wall

Litter -

Notes: convention center ponds have hibiscus, cattails. a giant bur oak is east of creek just downstream of here

10. Overstory - 50-70% cover - dominant:

-American elm, chinaberry

Midstory - % cover - dominant:

- willow, hackberry, ash sp.

Groundcover- 80-90% cover - dominant:

-rye, Britton's wild petunia, peppervine, giant ragweed

Litter -

Notes: gravel shoal with Britton's wild petunia, black willow saplings, giant ragweed, one green ash, elephant ear on bank.

11. Overstory - % cover - dominant:

-willow, pecan

Midstory - % cover - dominant:

- chinaberry, American elm, hackberry

Groundcover - % cover - dominant:

-Britton's wild petunia poison ivy

Litter -

Notes: bank steep, narrow

